Sustain the Mission
Secure the Future

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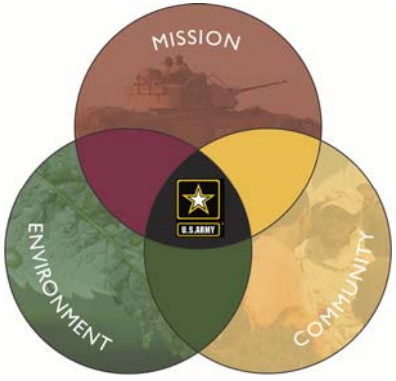
24 October 2006

Army Strategy for the Environment

- **Vision: long-term Army sustainability**
- **Enables Business Transformation**
- **Supports Army in all missions**
- **Applies to all Army units, organizations, personnel, suppliers, support contractors, and partners.**

Our Goals

- **Foster a sustainability ethic**
- **Strengthen Army operations**
- **Meet test, training, and mission requirements**
- **Minimize impacts and total ownership costs**
- **Enhance Well-being**
- **Drive Innovation**



<u>"Triple bottom line" Plus</u> – Mission, Environment, Community + Economy

"Planet Earth" - The Challenges

Consequences

- Mission constraints
- Public concerns
- Resource scarcity
- Rising costs
- Degradation of air, land, water
- Reduced well-being
- Competition for resources
- Threats to security

Sustain the Mission – Secure the Future

Challenges To Managing The Future

✓ **World population growing: 2006 = 6.5 Billion, by 2030 estimate is 7.9 Billion**

✓ **World oil demand up since 2000: Up 7 million barrels per day (mbd), 2 mbd increase in China, 1.4 mbd increase in India.**

✓ **Hurricanes Katrina and Rita shut down 27% of US oil refining capacity, production is still off 400,000 barrels per day.**

✓ **US oil imports increasing: 33% in 1973, 58% in 2005, 70% by 2020.**

✓ **US LNG (liquid natural gas) imports increasing: 3% in 2005, 25% in 2020.**

✓ **In 1973 North America consumed twice as much oil as Asia. In 2005 Asian consumption exceeded that in North America**

✓ **US oil consumption up: 20.7 mbd in 2004, 21.1 mbd in 2005.**

Leadership Committed to the Plan

"We must be a leader in energy efficiency and the use of renewable energy products and emerging technologies."—Francis Harvey, Secretary of the Army, 10 October, 2006 (Army News Service)

Five Goals of Energy Strategy -25 Year Plan

- Eliminate energy waste in existing facilities;
- Increase energy efficiency in new construction/renovations;
- Reduce dependence on fossil fuels;
- Conserve water resources; and
- Improve energy security.

EPAct 2005 Summary of Facility Impacts

- **Reduce facility energy consumption by 2% per year from FY2006 – FY2015 with baseline of FY2003 (Sec 102)**

- **Buildings designed to achieve energy consumption 30% below ASHRAE standard 90.1-2004 (new construction) (Sec 109) Meter electricity consumption in appropriate federal (Army) buildings by 1 Oct 2012 (Sec 103)**

- **Use *Energy Star*© and FEMP designated products in procurement of all products (i.e. mechanical equipment) (Sec 104)**

- **Dual-fueled vehicles shall be operated on alternate fuel (Sec 701)**

- **Electricity consumption shall be 7.5% renewable energy by 2013 and shall be 25% by 2025 (Sec 203 and 18 Nov 05 DUSD(I&E) MEMO)**

Army Energy Accomplishments to the Present

- 30% reduction in energy consumption from 1985 to 2005
- $ 576M Energy Savings Performance Contracts private investment in 109 contracts from 1996-2006
- $ 38.4M Energy Conservation Investment Program 22 projects 2005-2006
- Army has 23,500+ Alternate Fuel Vehicles – 48% of our NTV fleet.
- Energy Strategy signed by Secretary of the Army and OACSIM issued Energy Campaign Plan/ LEED Certified-New Construction
- $ 24.0B utilities infrastructure, $ 940M annual utility cost

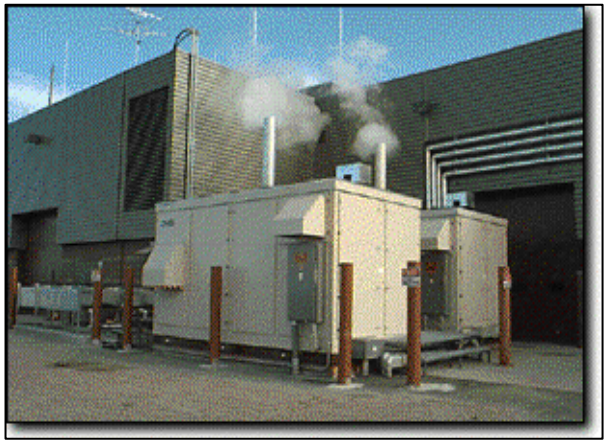
We are working to do more!

Proving the Concept

Renewable & Distributed Energy Technologies

Wind Power
Camp Williams, UT

Solar Water Heating
Fort Huachuca, AZ



Fuel Cell, Fort Richardson. AK

New Jersey National Guard Bureau
10 KVA Photovoltaic Array

Photovoltaic Applications

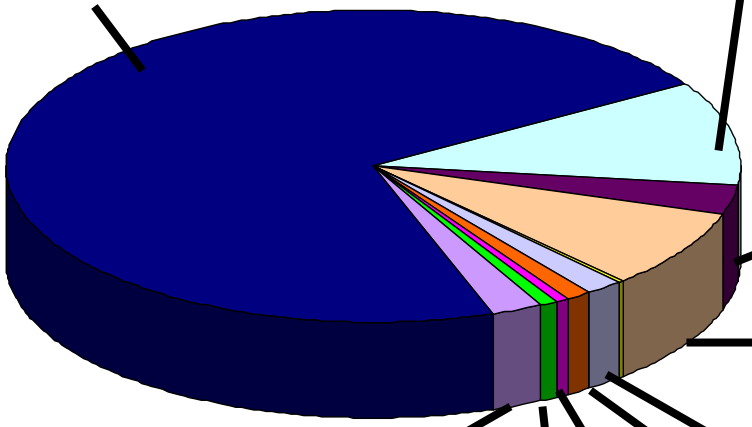
Grid Connected Array – Yuma Proving Ground, AZ

Remote Power Generation – Kwajalein Atoll

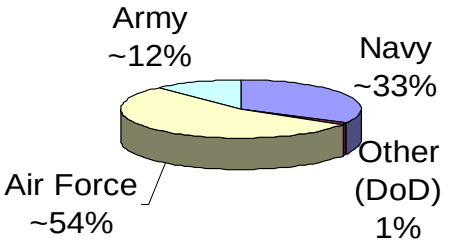
Lighting, Fort Irwin, CA

Energy and A Nation at War

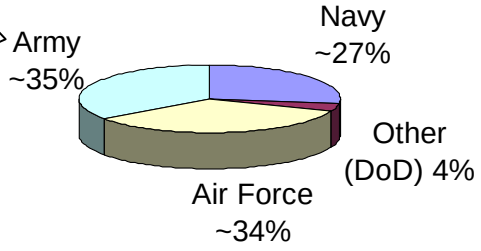
Commodity



DoD FUEL CONSUMPTION ~$8.3B



DoD INSTALLATION UTILITIES ~ $2.5B



919 Trillion BTU

Energy Security for the Battlefield

"To improve the security posture of the al-Anbar province of Iraq, [Multi-National Force-West] requires a renewable and self-sustainable energy solution to support forward operating bases, combat outposts and observation posts throughout MNF-W's battlespace," a Joint Staff Rapid Validation and Resourcing Request certified by MNF-W leaders states.

Command officials certified the request on July 25 on behalf of Marine Corps Maj. Gen. Richard Zilmer, the MNF-W chief. The request is categorized as a "priority 1" need.

In the document, the region's U.S. military leaders call on the Pentagon to send more renewable energy systems to the country because they could leverage resources like sunlight or wind to produce power for bases and outposts. Commanders assert that tapping renewable energy sources would lessen dependence on fossil fuels -- a move that could save lives.

"A proposed alternate solution -- one that reduces the number of convoys while providing an additional capability to outlying bases -- is to augment our use of fossil fuels with renewable energy, such as photovoltaic solar panels and wind turbines, at our outlying bases," the request states. "By reducing the need for [petroleum-based fuels] at our outlying bases, we can decrease the frequency of logistics convoys on the road, thereby reducing the danger to our Marines, soldiers, and sailors."

From *Inside the Pentagon* (10 Aug 06)

Biomass System and Constructed Wetlands

← Two 50kW systems in Cavalry Base, El Salvador

➔ Constructed wetland for Wastewater treatment, Cavalry Base, El Salvador

Light Water Purification Powered by Solar Energy

← Sample Picture of Mobile LWP (Reverse Osmosis)

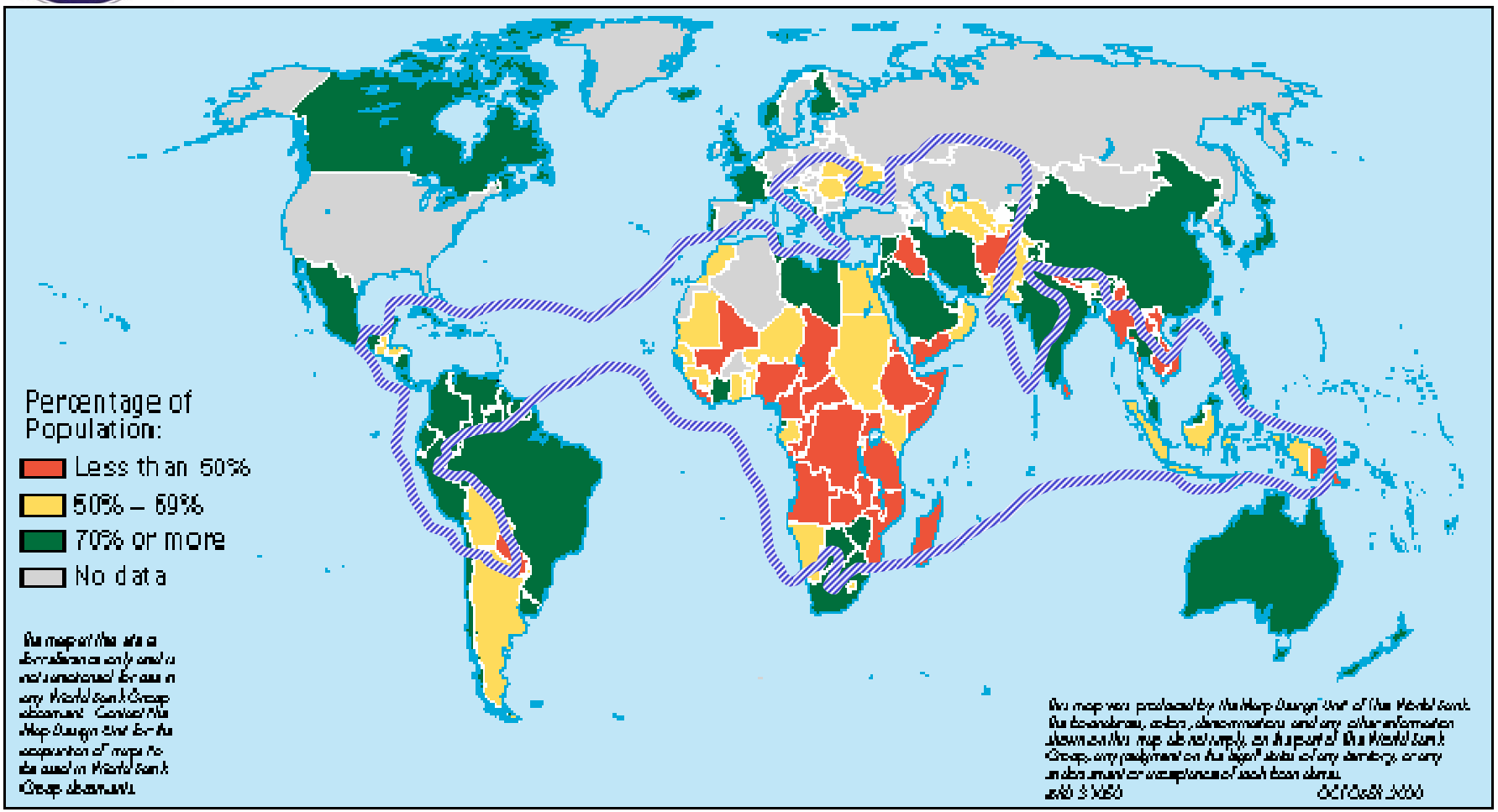
→ Sample Picture of Thin Film PV Tent

Micro-Hydro

➔ Sample 10kW micro-hydro system (for Rivers) - **Submergible propeller hydro turbines**

➔ **Sample Picture of an installation of a low head turbine** (2kW system)

Resource Scarcity Contributes to Global Instability



There is no Security without Sustainability / Sustainability is Security

QUESTIONS

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***Army Strategy for the Environment*:**
http://www.asaie.army.mil/Public/ESOH/doc/ArmyEnvStrategy.pdf

Army Sustainability Website: http://www.sustainability.army.mil/